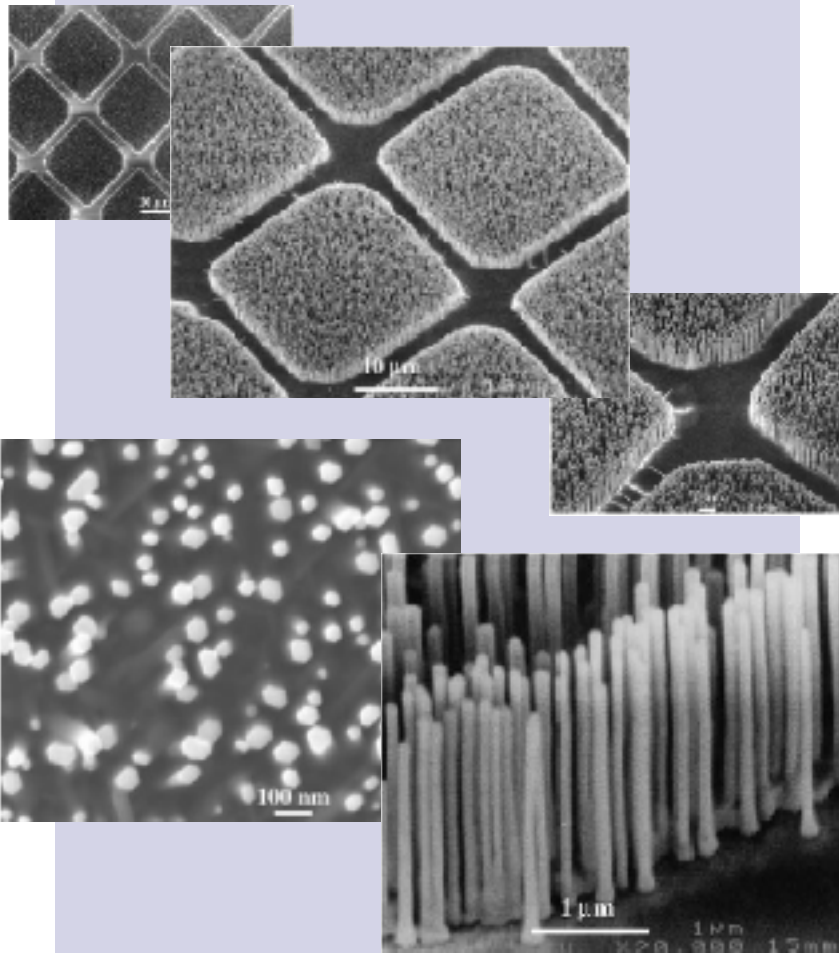
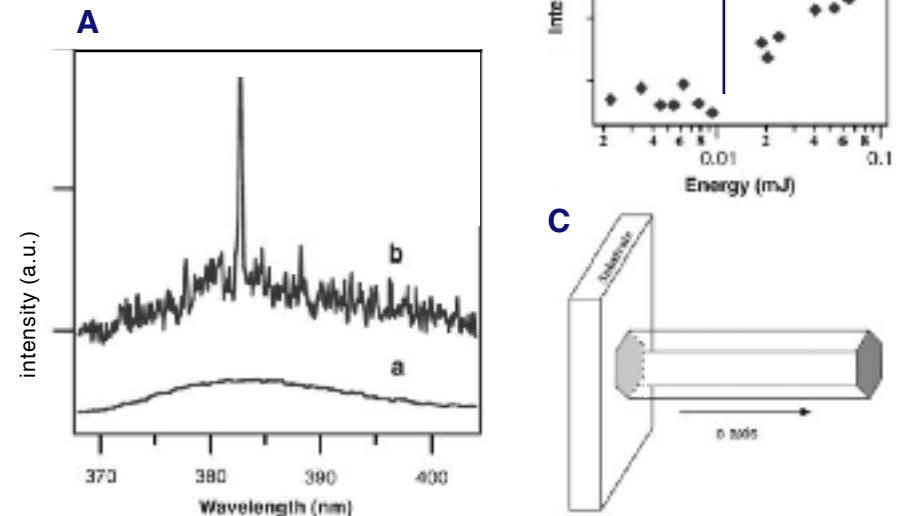


Catalyzed Epitaxial Crystal Growth of ZnO



A thin film of gold nanoclusters was deposited on a sapphire substrate in a pattern of squares and exposed to ZnO vapor. ZnO crystals grew on the nanocrystals creating arrays of uniformly sized "nanowires" seen in increasing magnification clockwise from top left. View from above at lower left.

Optically Stimulated Laser Emission



ZnO nanowires exposed to low light intensities emit a broad light spectrum (graph A, curve a). Above a certain intensity threshold, a sharply peaked spectrum indicative of laser action is observed (curve b). The lasing threshold can also be seen in the plot of emitted intensity vs. pump power, (B). It is thought that the "laser cavity" is formed by the ends of the ZnO nanowires acting as mirrors as shown in C.